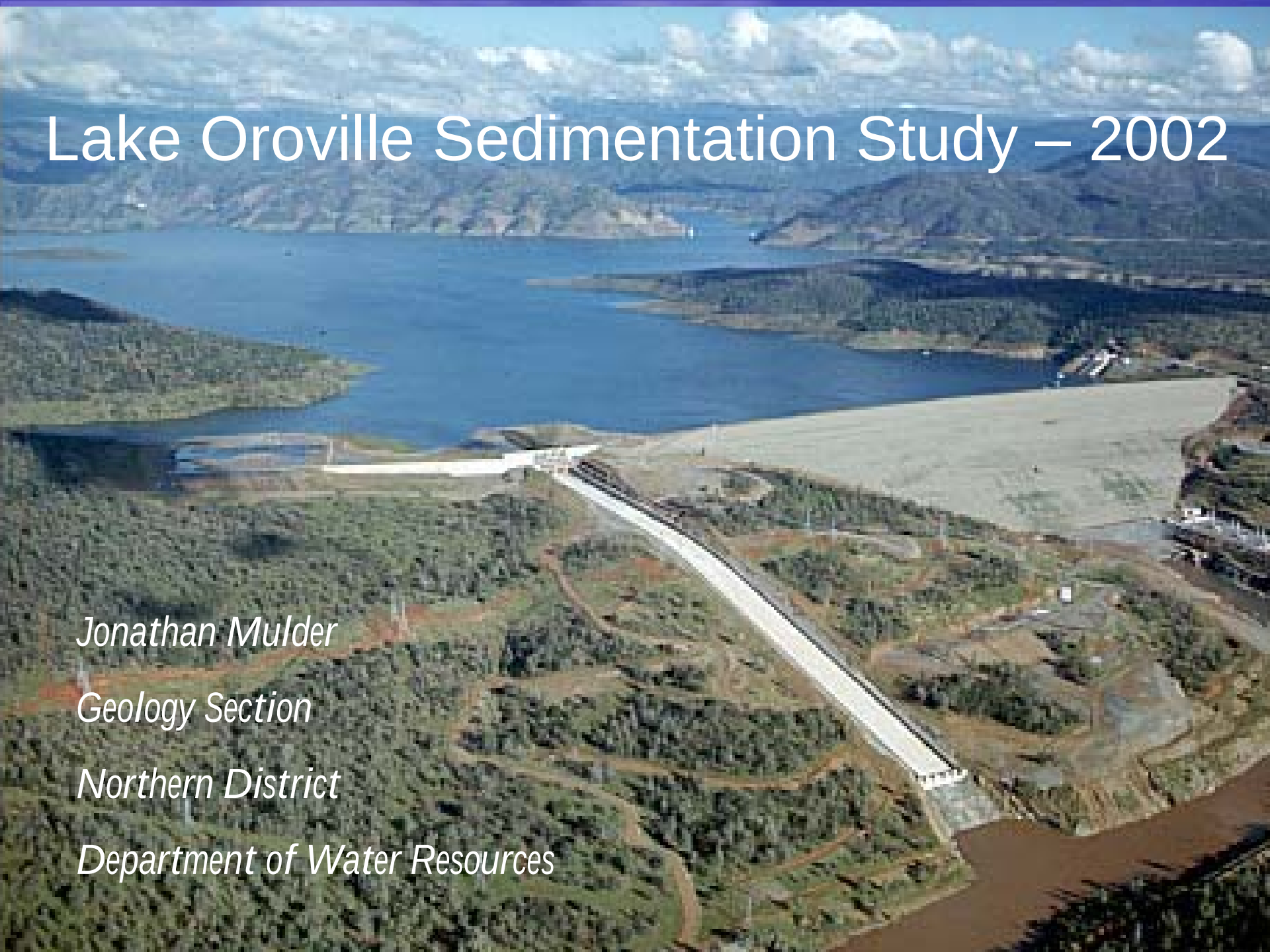
Lake Oroville Sedimentation Study – 2002

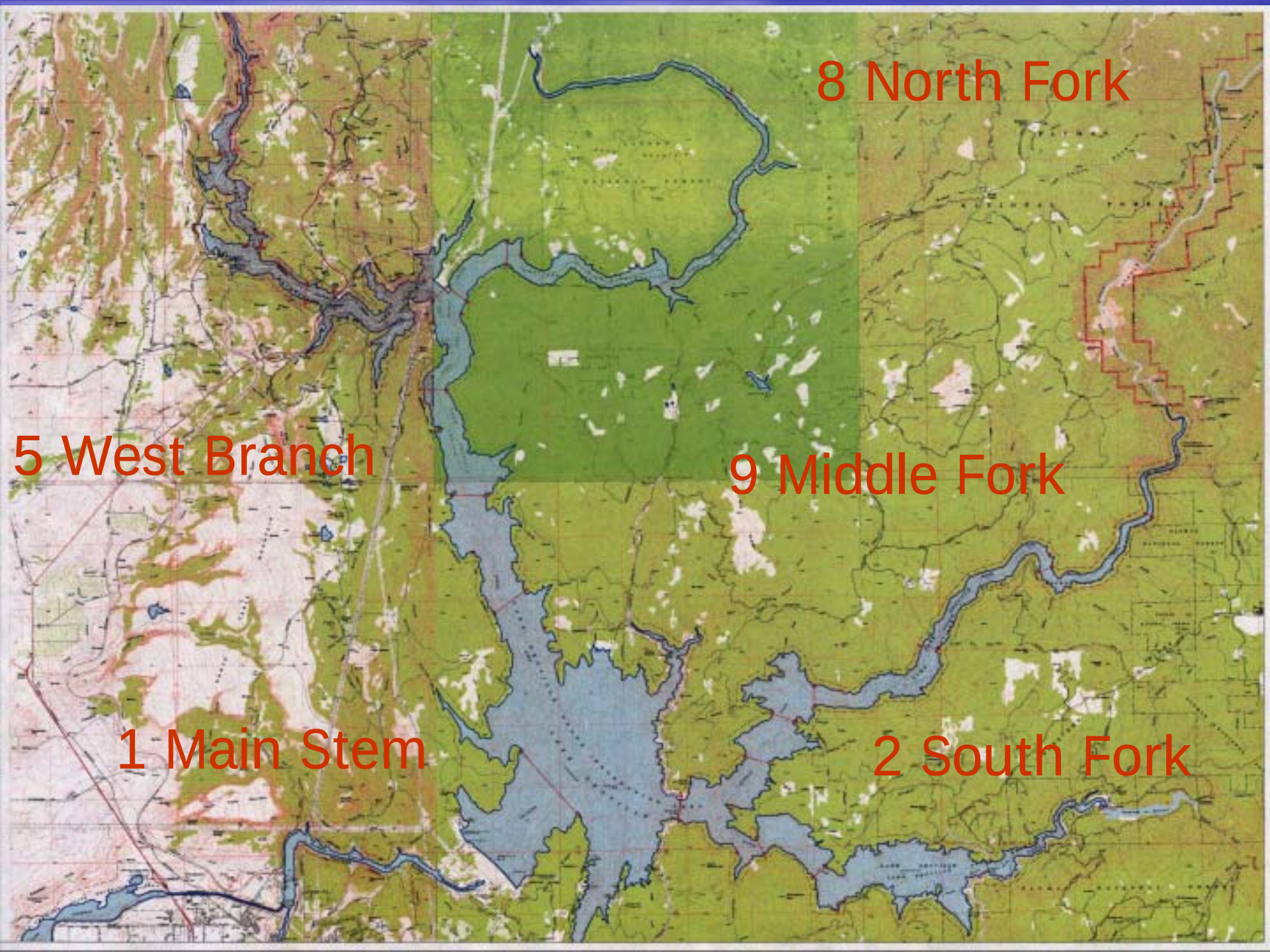


Jonathan Mulder

Geology Section

Northern District

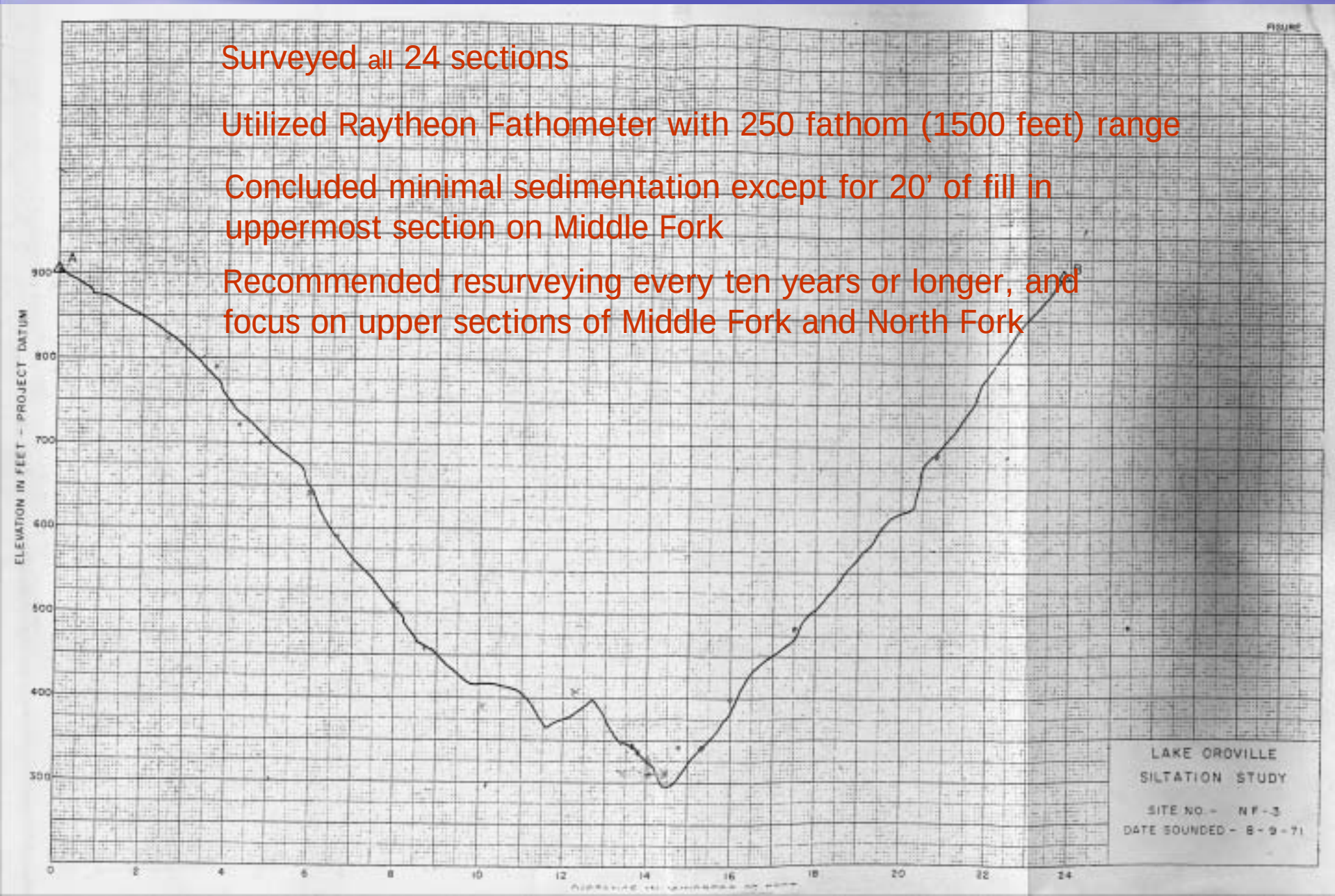
Department of Water Resources


8 North Fork
5 West Branch
9 Middle Fork
1 Main Stem
2 South Fork

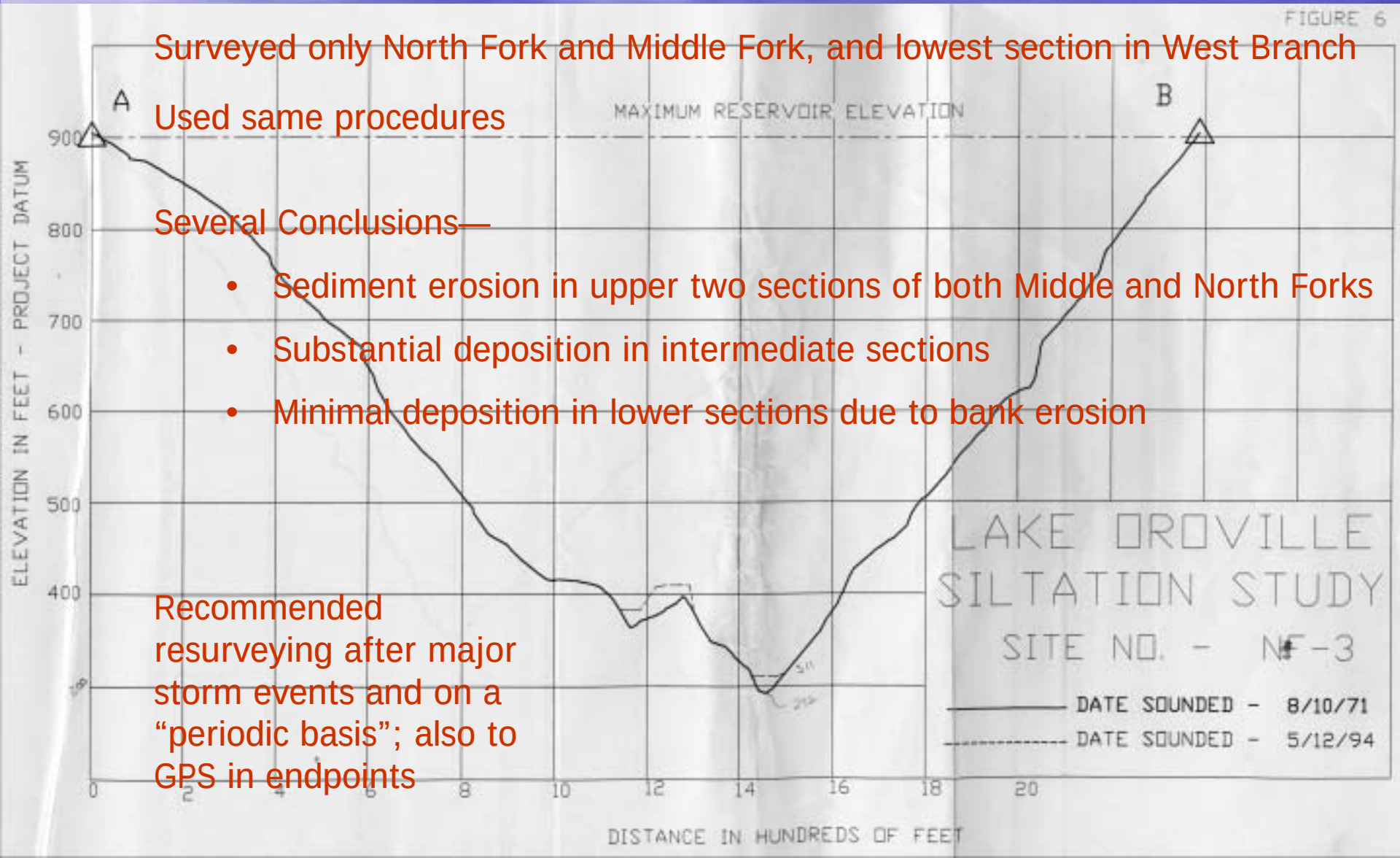
Previous Studies

- 1971 Survey
- 1993-94 Survey

1971 Survey


Surveyed all 24 sections
Utilized Raytheon Fathometer with 250 fathom (1500 feet) range
Concluded minimal sedimentation except for 20' of fill in uppermost section on Middle Fork
Recommended resurveying every ten years or longer, and focus on upper sections of Middle Fork and North Fork
ELEVATION IN FEET - PROJECT DATUM
900
800
700
600
500
400
300
0
2
4
6
8
10
12
14
16
18
20
22
24
LAKE OROVILLE
SILTATION STUDY
SITE NO - NF-3
DATE SOUNDED - 8-9-71

1993-94 Survey



Surveyed only North Fork and Middle Fork, and lowest section in West Branch

Used same procedures

Several Conclusions—

- Sediment erosion in upper two sections of both Middle and North Forks
- Substantial deposition in intermediate sections
- Minimal deposition in lower sections due to bank erosion

Recommended resurveying after major storm events and on a “periodic basis”; also to GPS in endpoints

2002 Survey

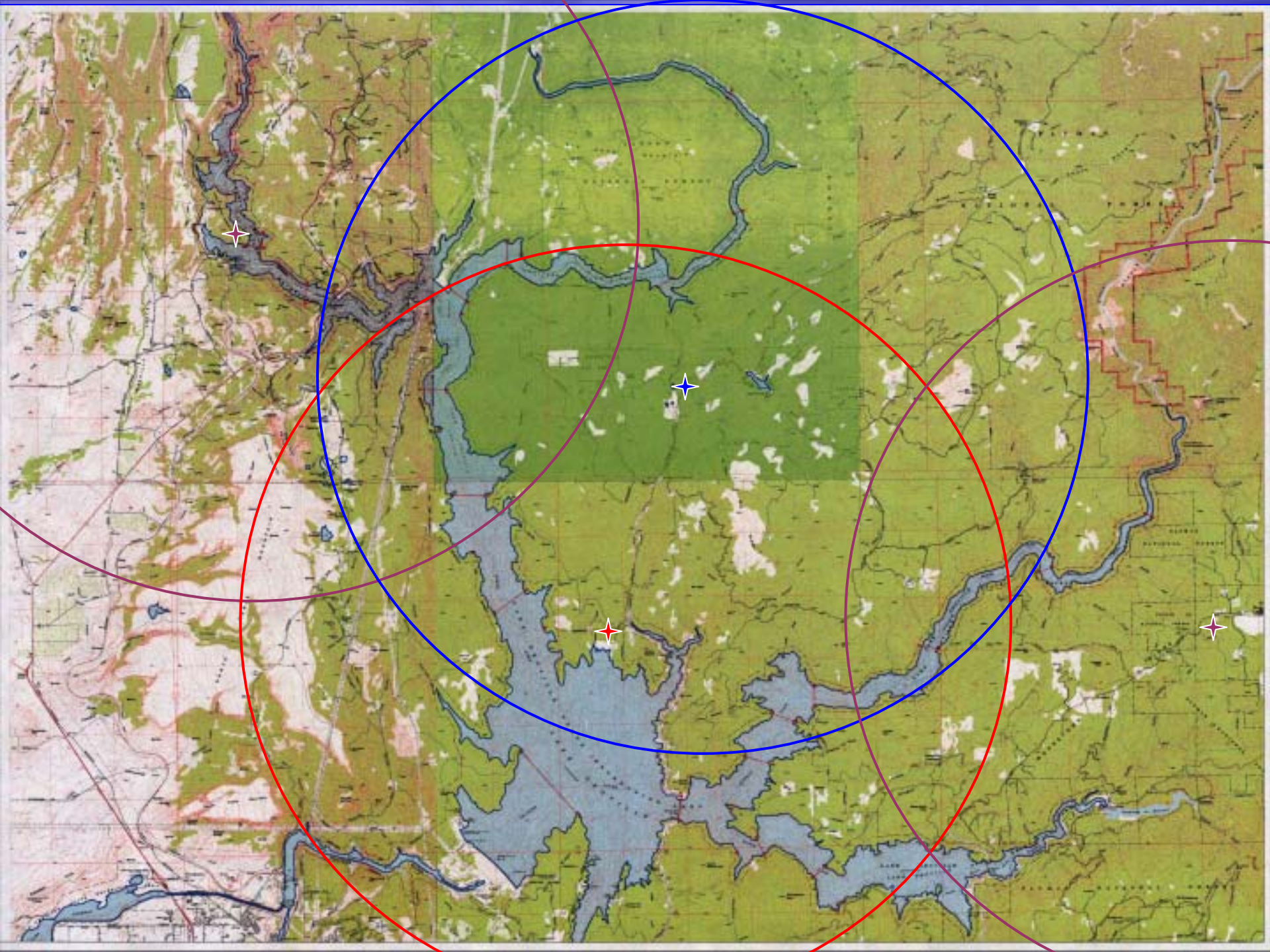
- GOALS

  GPS endpoints for all 24 sections

  GPS side slopes

  Sound bottom while hooked to GPS

  Sound original thalweg trace while hooked to GPS

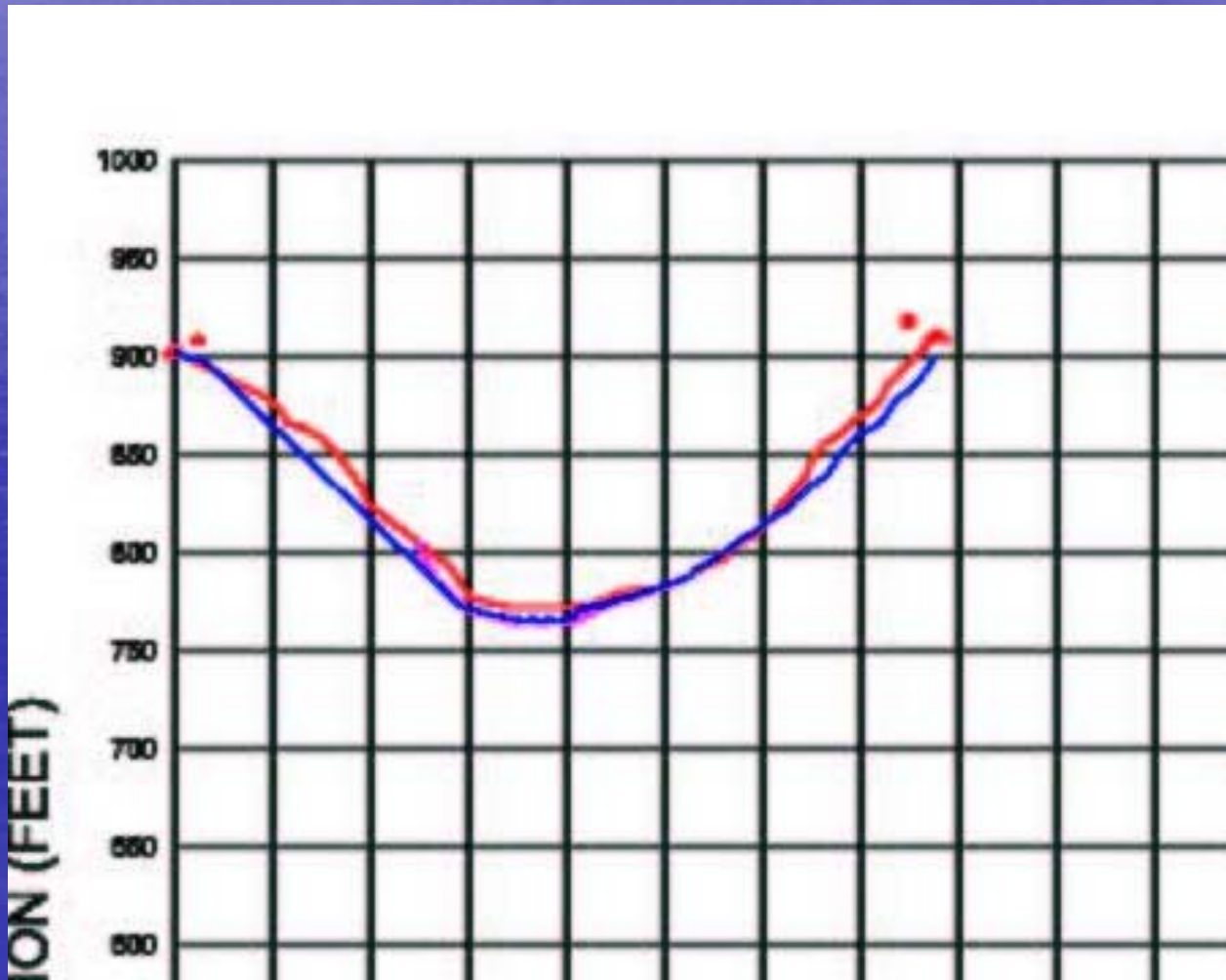


2002 Survey

- Accomplishments (thus far)
  - 20 Sections
    - GPS'd endpoints and sounded bottom and measured side slopes while hooked to GPS
  - 1 Section (MF-7)
    - Surveyed/sounded section with total station, but did not tie in to absolute coordinates

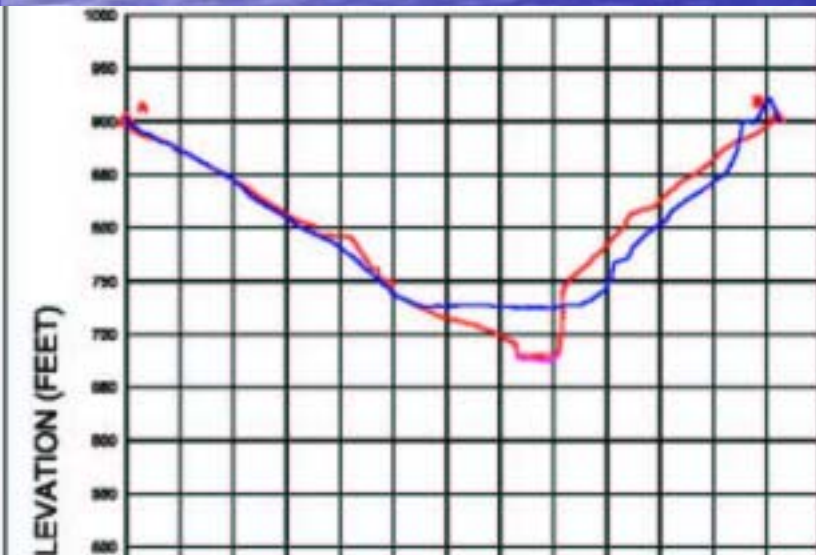
Preliminary Findings (North Fork Sections only)

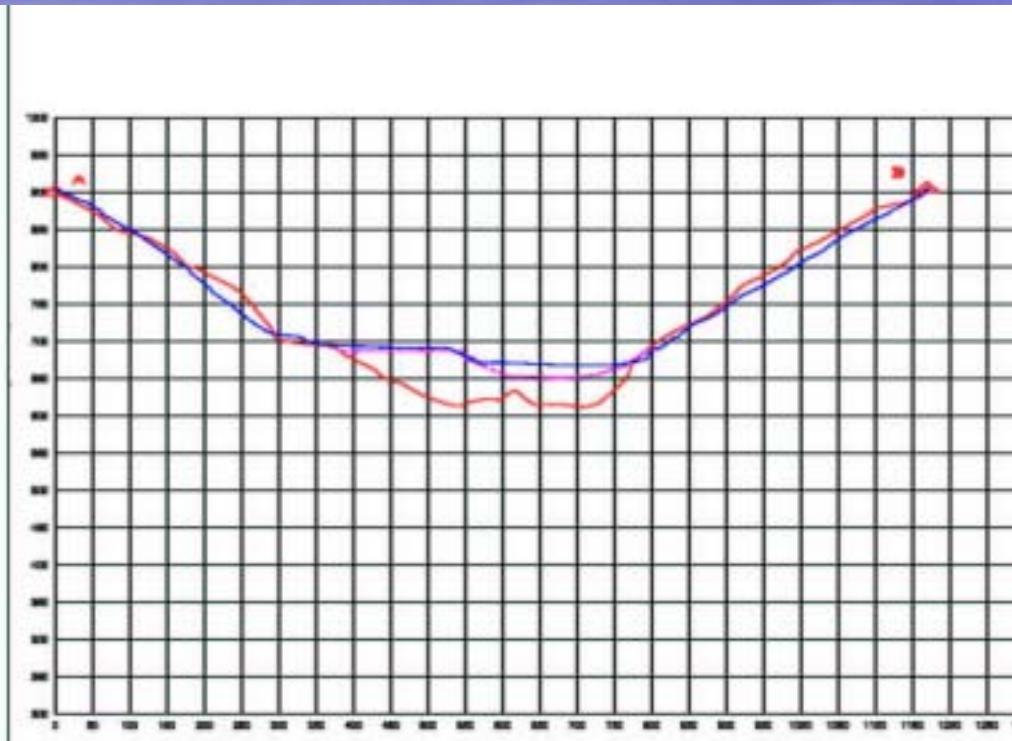
- No significant change in uppermost section (NF-9)



Preliminary Findings (North Fork Sections only)

- Substantial deposition in NF-8 and NF-7



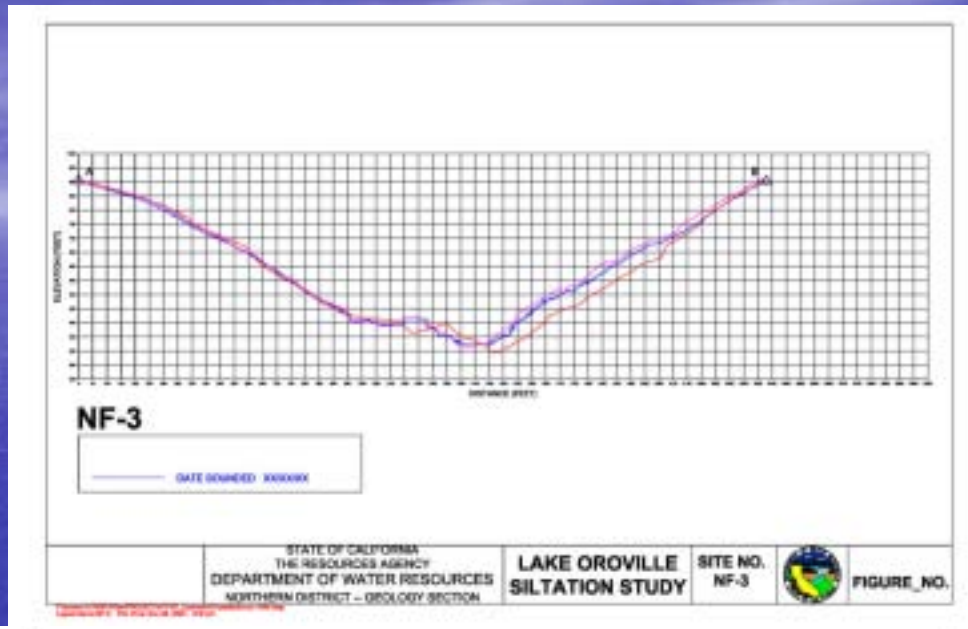


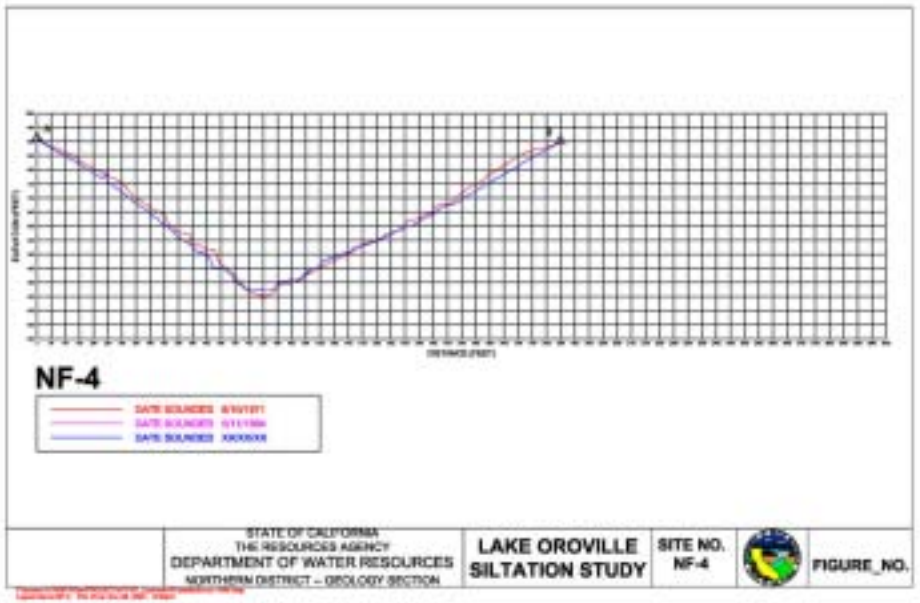
NF-7

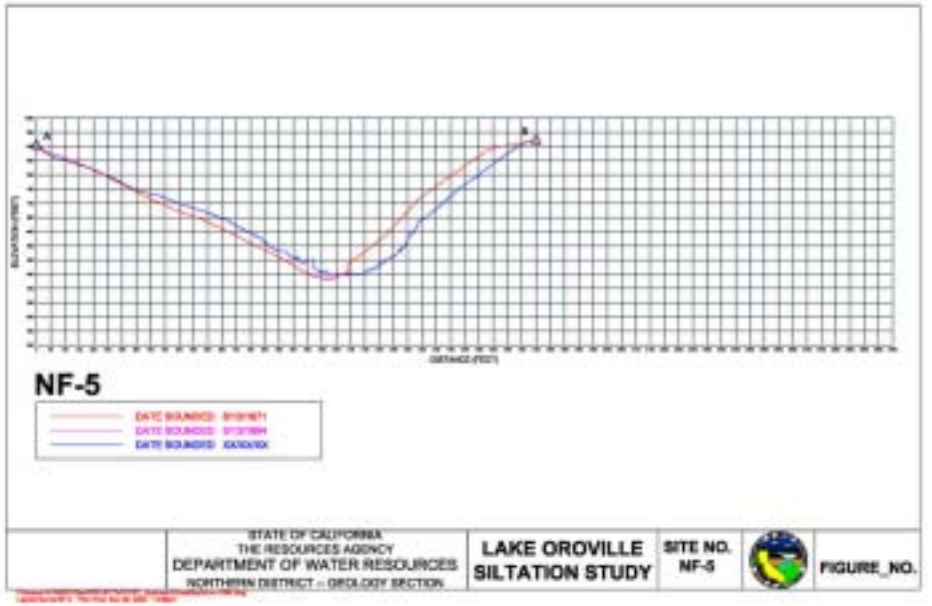
DATE SOUNDED 7/27/1971
DATE SOUNDED 3/10/1993
DATE SOUNDED XX/XX/XX

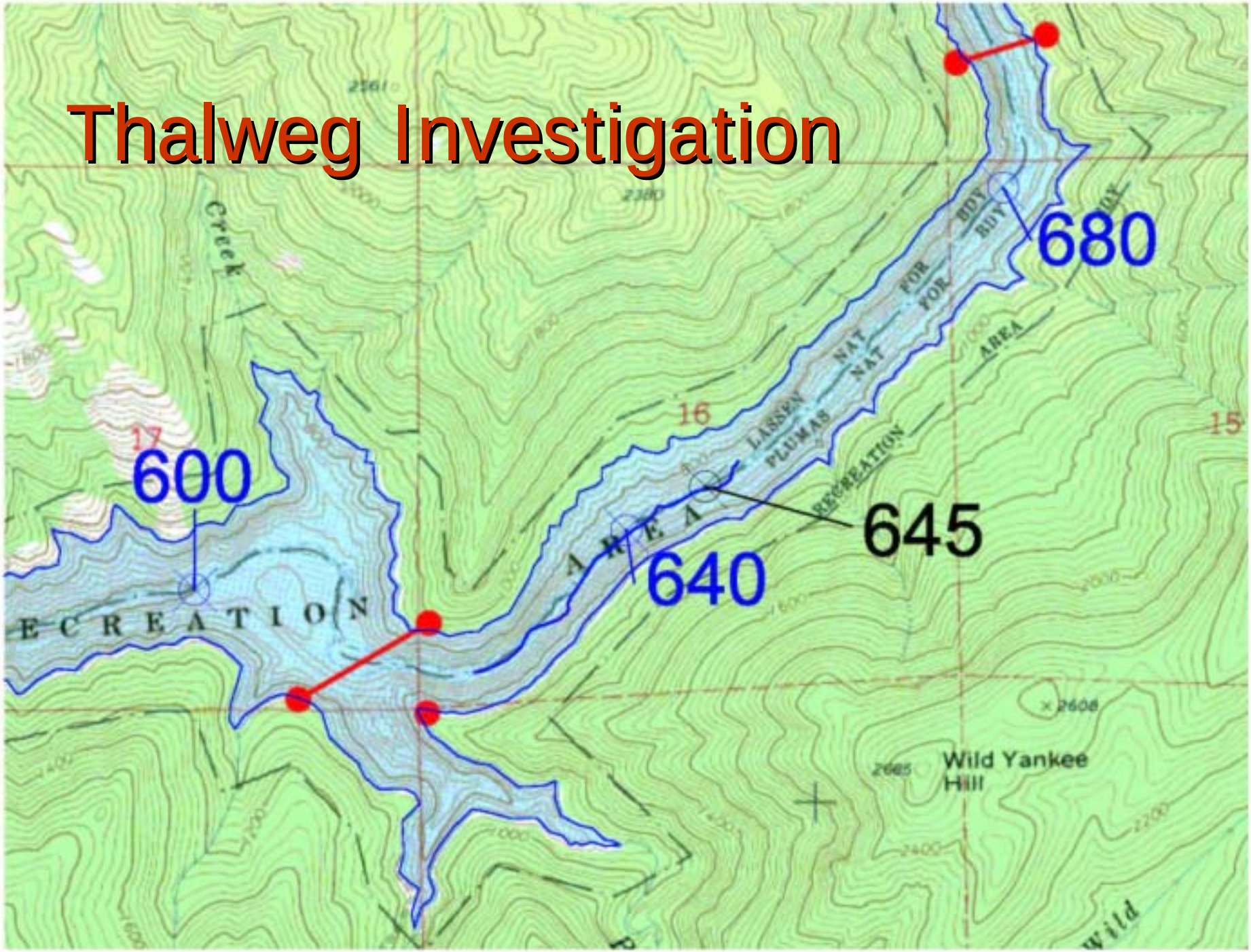
Preliminary Findings (North Fork Sections only)

- Decreasing amounts of deposition in lower sections (i.e. NF-5 thru NF-2)

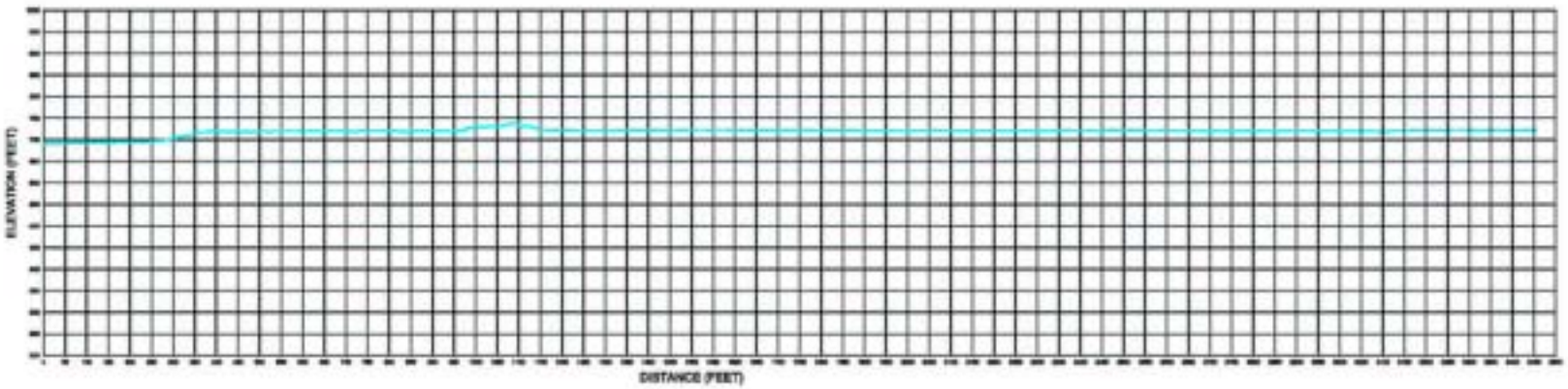






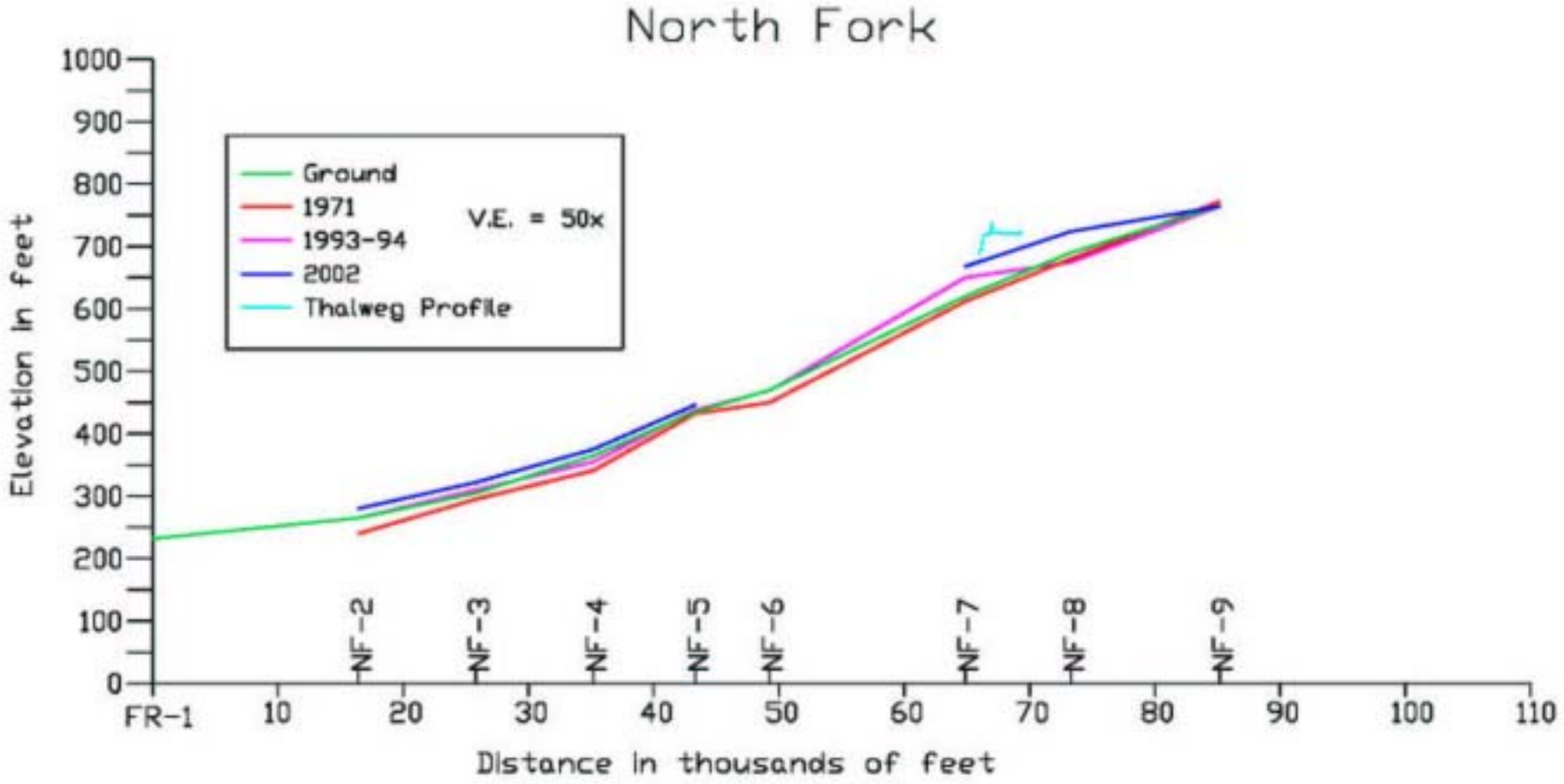

Thalweg Investigation
680
600
645
640
Wild Yankee Hill

Thalweg Investigation

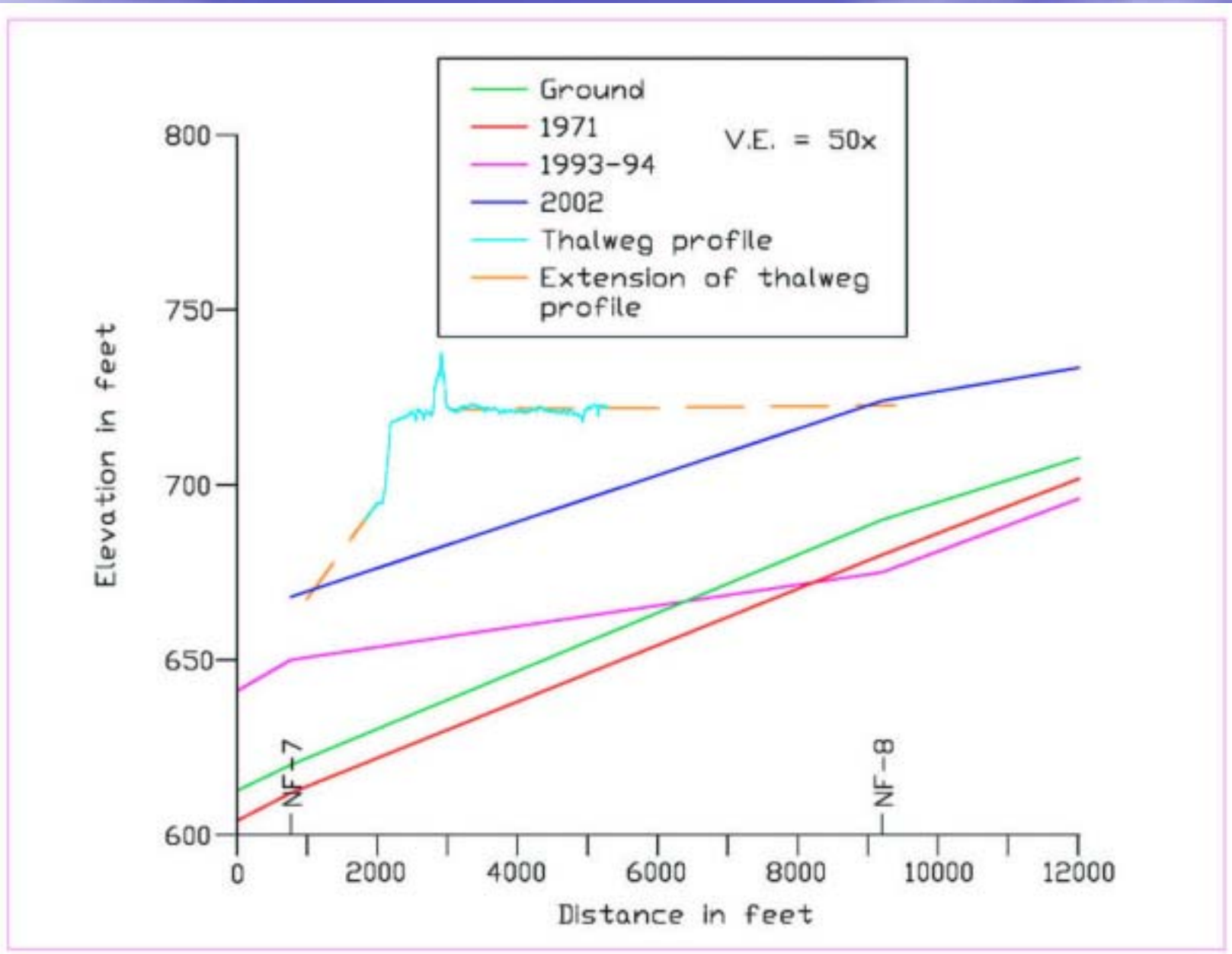


	STATE OF CALIFORNIA THE RESOURCES AGENCY DEPARTMENT OF WATER RESOURCES NORTHERN DISTRICT -- GEOLOGY SECTION	LAKE OROVILLE SILTATION STUDY	SITE NO. AA-X		FIGURE_NO.

Thalweg Investigation



Thalweg Investigation

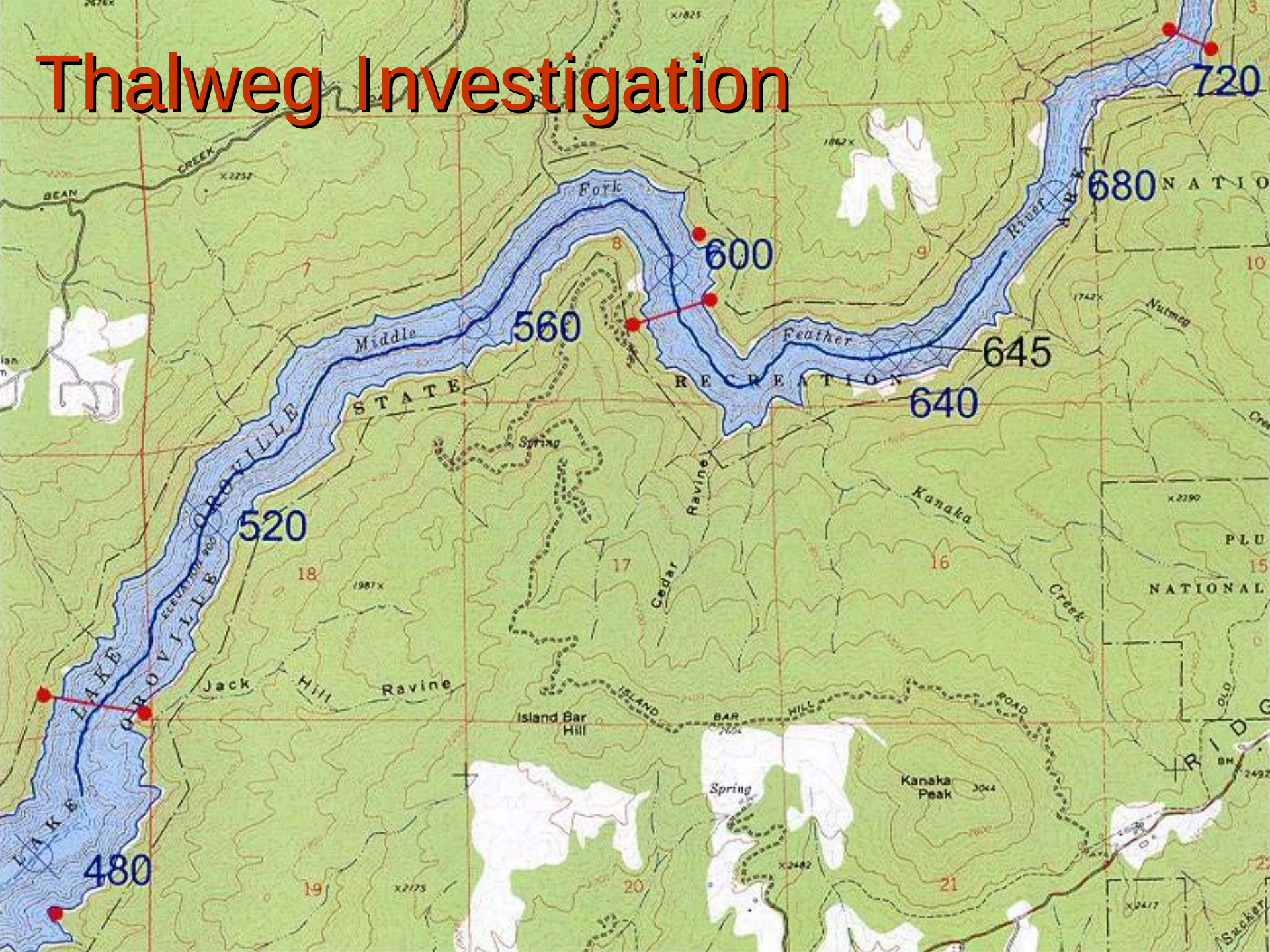


Thalweg Investigation

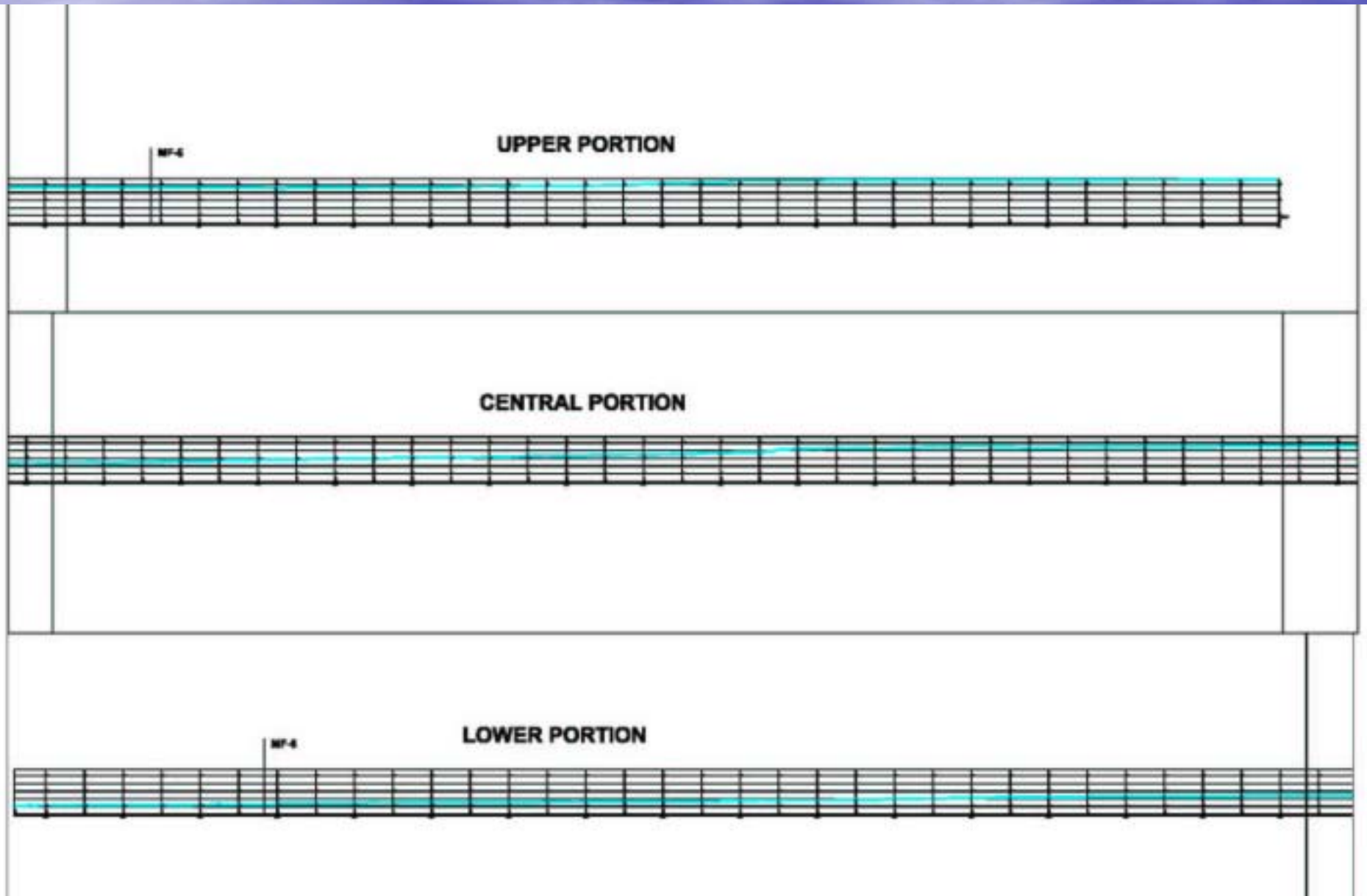
Thalweg Investigation

Thalweg Investigation

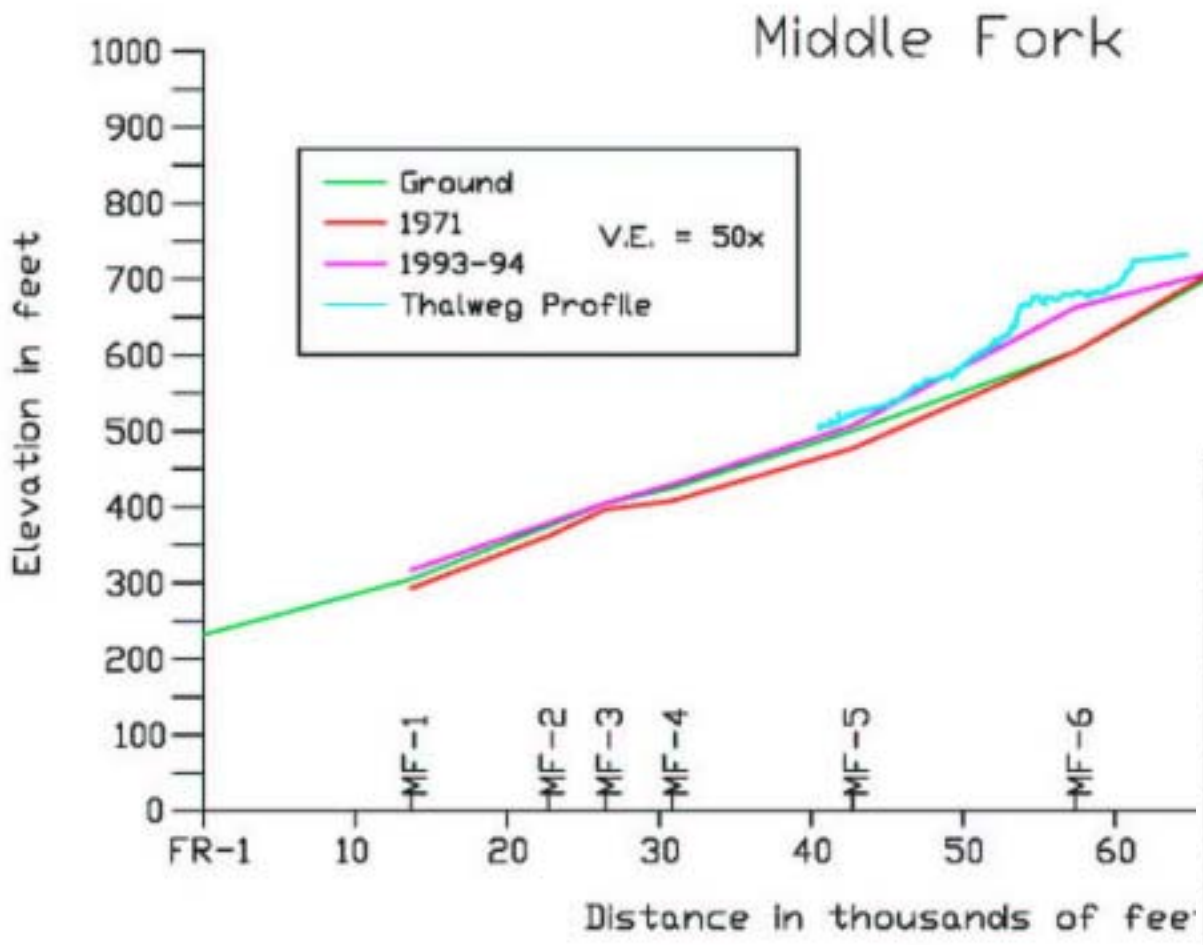
Thalweg Investigation



Thalweg Investigation



Thalweg Investigation



Lake Oroville Water Levels
1988-2001

Year	High Water	Low Water
1988	848	730
1989	890	749
1990	792	675
1991	751	651
1992	780	700
1993	900	722
1994	840	740
1995	900	750
1996	900	840
1997	900	785
1998	900	840
1999	895	795
2000	875	750
2001	800	715
2002	840	700

Thalweg Investigation

Thalweg Investigation

Thalweg Investigation

Thalweg Investigation

Thalweg Investigation

Thalweg Investigation

Bank Erosion

Bank Erosion

“CONCLUSIONS”

- Major sedimentation events occur as pulses
- Sediment wedges migrate downstream only as far as the low water level since a “flood event”
- Minimal sedimentation below historic low water level